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## Method and system for robot end effector path correction using 3-D ultrasound sensors

[Veryba, Y.](#) [Kourtch, L.](#) [Verigo, B.](#) [Murashko, V.](#)

Dept. of Mech. Eng., Belarussian State Polytech. Acad., Minsk;

*This paper appears in: **Intelligent Control and Automation, 2000.***

**Proceedings of the 3rd World Congress on**

Meeting Date: 06/28/2000 -07/02/2000

Publication Date: 2000

Location: Hefei, China

On page(s): 1240-1243 vol.2

Volume: 2, References Cited: 4

Number of Pages: 5 vol. 3828

INSPEC Accession Number: 6748332

**Abstract:**

A method and system for correcting a preprogrammed robot end effector path to reduce the kinematic error are developed. The approach used in the method is to mount 3D ultrasound position sensor on the robot end effector and compute 3D Cartesian position of this sensor using 1D range measurements between the senders and an array of ultrasound receivers at fixed, predetermined positions. The method and system allow speedy correction of a robot path with economical usage of computer resources. The method includes steps of sensing and measuring path offsets between the idealized end effector location and the actual location of the manipulator end effector at a plurality of waypoints. Then, after appropriate calculations, the method includes the steps of correcting the coordinates of waypoints within the preprogrammed path, transforming the preprogrammed path coordinates into machine control coordinates, and providing a controller for the robot manipulator with such machine control coordinates. A 3D ultrasound position sensor used in the method provides low-cost, high precision measurements of the Cartesian position of a robot end effector within the robot workspace.

**Index Terms:**

computational complexity manipulator kinematics position control position measurement ultrasonic transducer arrays 1D range measurements 3D Cartesian position 3D ultrasound position sensor Cartesian position US receiver array kinematic error machine control coordinates manipulator end effector location path offsets robot end effector path correction robot workspace

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